lstat2140

2019

Non parametric statistics

UCLouvain

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

4 credits	15.0 h + 5.0 h	Q1

Teacher(s)	Pircalabelu Eugen ;
Language :	French
Place of the course	Louvain-la-Neuve
Aims	1 The students will obtain knowledge about the basic concepts of nonparametric statistical inference. They will learn about elementary nonparametric testing procedures. They will be able to use these nonparametric procedures for analyzing real data, and this by using, for example, statistical software packages. - - - - *The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".*
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** During the lectures we will explain for each of the statistical procedures the following : the motivation behind a test statistic, how to obtain the distribution of the test statistic under the null hypothesis, and how to construct the testing procedure. The aim is to get insight into nonparametric testing procedures and to learn about the different aspects of such procedures. At the end of the course the students have to work through some course work (a project) that will allow them to get more familiar with the use of nonparametric methods in practical applications, when for example analyzing real data.
Content	• Hypothesis tests concerning location and dispersion of a population, given an i.i.d. sample • Detection of differences in location and/or dispersion between two populations • Goodness-of-fit tests for checking whether an unknown distribution belongs to a given parametric family of distributions, or equals a specific parametric distribution • Measures of association between two (or more) random variables • The use of order statistics and rank statistics in nonparametric estimation and testing procedures
Bibliography	• Gibbons, J.D. (1971). Nonparametric Statistical Inference. McGraw-Hill, New York. • Hollander, M. et Wolfe, D.A. (1999). Nonparametric Statistical Methods. Second Edition. Wiley, New York. • Lehmann, E.L. (1998). Nonparametrics: Statistical Methods Based on Ranks. Revised First Edition. Prentice Hall, New Jersey. • Maritz. J.S. (1995). Distribution-free Statistical Methods. Second Edition. Chapman and Hall, New York. • Mouchart, M. et Simar, L. (1978). Méthodes nonparamétriques. Recyclage en statistique, volume 2. Université catholique de Louvain, Louvain-la-Neuve, Belgique. • Randles, R. et Wolfe, D. (1979). Introduction to the Theory of Nonparametric Statistics. Wiley, New York.
Faculty or entity in charge	LSBA

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Mathematics	MATH2M	4		🔍
Master [120] in Statistic: Biostatistics	BSTA2M	4		🔍
Certificat d'université : Statistique et sciences des données (15/30 crédits)	STAT2FC	4		🔍
Master [120] in Statistic: General	STAT2M	4		🔍
Master [120] in Economics: General	ECON2M	5		🔍